DOCUMENT RESUME

ED 318 465 IR 014 445

AUTHOR	Arias, Armando A., Jr.; Bellman, Beryl L.
TITLE	BESTNET: Binational English & Spanish Telecommunications Network. Final FIPSE Report.
INSTITUTION	San Diego State Univ., Calif.
SPONS AGENCY	Fund for the Improvement of Postsecondary Education (ED), Washington, DC.
PUB DATE	88
NOTE	22p.
PUB TYPE	Reports - Evaluative/Feasibility (142)
EDRS PRICE	MF01/PC01 Plus Postage.
DESCRIPTORS	*Bilingual Education Programs; *Computer Assisted Instruction; Computer Networks; Computer Science Education; *Distance Education; Higher Education; Hispanic Americans; Mathematics Instruction; Program Evaluation; Telecommunications; *Teleconferencing; *Telecourses; Videotape Recordings
IDENTIFIERS	*Binational English and Spanish Telecomm Network; Fund for Improvement of Postsecondary Education

ABSTRACT

The final evaluation of BESTNET (the Binational English and Spanish Telecommunications Network) is described. Undertaken as a collaborative effort to experiment with new telecommunications media in distance education and to attract Hispanic students into the science and engineering fields, the project involved the development of a number of bilingual telecourses in mathematics and computer sciences. A number of the telecourses utilized lectures on videotape supplemented by computer conferencing and electronic mail, and several others were wholly delivered via computer communications. Several universities in the United States and Mexico collaborated, and Mexican faculty taught video lectures in Spanish under the technical supervision of U.S. faculty. Those courses were offered to Spanish-as-a-first-language students in the United States. (GL)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

SCOPE OF INTEREST NOTICE

The ERIC Facility has assigned this document for processing to: IR

In our judgment, this document is also of interest to the Clearinghouses noted to the right. Indexing should reflect their special points of view. FL

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☒ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

ED318465

FINAL FIPSE REPORT

for

BESTNET: Binational English & Spanish Telecommunications Network

by

Armando A. Arias, Jr., Ph.D. and Beryl L. Bellman, Ph.D.
San Diego State University

IR014445

BEST COPY AVAILABLE

Paragraph Description Information

Project Director: Armando A. Arias, Jr., Ph.D.
San Diego State University - Imperial Valley Campus
720 Heber Avenue, Calexico CA
tel: 619/357-0974

Co-Project Director: Beryl L. Bellman, Ph.D.
Western Behavioral Sciences Institute
1150 Silverado
La Jolla, CA
tel: 619/459-3811

The project involved the development of a number of bilingual telecourses, that involved video recorded lectures supplemented by computer conferencing and electronic mail and several courses that were wholly delivered using computer communications. Several universities in the United States and Mexico collaborated in the project, so that Mexican faculty taught video lectures in Spanish under the technical supervision of US faculty, and those courses were offered to Spanish as a first language students in this country.

Executive Summary

Project Title: BESTNET: Binational English and Spanish Telecommunications Network.

Grantee Organization: San Diego State University.

Project Director: Armando A. Arias, Jr., Ph.D.
San Diego State University - Imperial Valley Campus
720 Heber Avenue, Calexico CA
tel: 619/357-0974

Co-Project Director: Beryl L. Bellman, Ph.D.
Western Behavioral Sciences Institute
1150 Silverado
La Jolla, CA
tel: 619/459-3811

Overview The project involved the development of a number of bilingual telecourses, that involved video recorded lectures supplemented by computer conferencing and electronic mail and several courses that were wholly delivered using computer communications. Several universities in the United States and Mexico collaborated in the project, so that Mexican faculty taught video lectures in Spanish under the technical supervision of US faculty, and those courses were offered to Spanish as a first language students in this country.

Purpose The purpose of this collaborative effort was to experiment with new communications media in distance education, and to attract Hispanic students into the science and engineering fields. In order to locate qualified Spanish speaking faculty we involved several Mexican institutions and networked several of their faculty and administrators with counterparts from universities in the United States. Thus we called the project BESTNET, which is an acronmym for the Binational English and Spanish Telecommunications Network. It basically represents a consortium of universities, colleges and research institutes in both the United States and Mexico, although the FIPSE grant is housed at San Diego State University and the Digital Equipment Corporation grant at the Western Behavioral Sciences Institute. BESTNET was initially created by the FIPSE grant to produce a number of video telecourses that are now made interactive using computer mediated communication or conferencing. The initial courses are in natural and physical sciences, mathematics and computer sciences, however new courses in other disciplines are now being added by the various member institutions. In addition, both faculty and administrators from each of the member institutions participated in a number of computer conferences to plan and evaluate the project and to discuss various related interests in the form of symposia and conjoint research projects.

Background and Origins During the past three years BESTNET has grown into an electronic university consortium with member institutions in each of the Southwestern states and a number of universities, technical institutes and research institutes in Mexico. During years 2 and 3 of FIPSE funding representative from these institutions have been engaged in discussions using a VAXnotes conferencing system supplied by the

Western Behavioral Sciences Institute for the project. At the present time there are three major conferences involved in both the planning and evaluation of BESTNET programs. In addition there are several other conferences that are directly related to the offering of BESTNET courses during the final year of the first FIPSE funding and currently under renewed funding.

Project Description The project involved the use of computer conferencing, including asychronous conferences (where comments are entered and responded at different times) synchronous phone or chat interaction (comments are entered and responded to while everyone is online at the same time for electronic office hours and student support/study groups), and electronic mail, which permit faculty to interact with students at a number of dispersed off-campus sites located in high Hispanic concentration areas. This technology was used in conjunction with video recorded lectures, which formally present course content that is then treated as topics in the computer conferences. Students watched video lectures either on campus, at home or at off-campus, albeit conveniently located, learning centers in their communities, and then directly interact with faculty by computers donated by the Digital Equipment Corporation networked by telephone modem to a host MicroVAX computer at the Western Behavioral Sciences Institute, which provided a specially tailored version of VAXnotes conferencing software for this project. In this manner students were able to ask questions and receive responses, access class assignments, turn in homework and obtain readings that were downloaded and printed out as hardcopies to take home to study. The Digital Equipment Corporation provided, in conjunction with FIPSE support for this project, 40 VAXmate computer workstations with modems to our learning centers.

Since the project began in September, 1985, BESTNET has produced telecourses in mathematics and computer sciences in cooperation with the Mexican universities listed in the full report. The first course was a two semester video telecourse, entitled "Mathematics Zero," taught by Josefina Castillo of the Centro de Ensenanza Technica y Superior (CETYS), a major private university with campuses in Mexicali, Tijuana and Ensenada. The course was offered for the first time in the second year on a cable public education channel in the Imperial Valley of California, where there is an over 65 percent Hispanic population. All the other courses in the BESTNET project are video/computer or only computer conferencing interactive. Video production was completed on Single Variable Calculus, Calculus with Analytic Geometry, Principles of Physics and Introduction to Computer Programming/Pascal and Intermediate Computer Programming/Data Structures.

Summary and Conclusions We developed and offered six courses that were produced under the auspices of the FIPSE grant, and also a number of others that are being developed and/or are being given by faculty at various of the institutions. Each of the universities offer their own credit for the courses. The six FIPSE courses meet prerequisite requirements for several different majors as described in the San Diego State University catalog, and also meet identical requirements for those same majors at each of the above named institutions.

Project Overview

The following is the final evaluation of project BESTNET, which is co-directed by Dr. Armando A. Arias, Jr., associate dean of academic affairs and research at San Diego State University, and Dr. Beryl L. Bellman of the Western Behavioral Sciences Institute. The project's advisory committee is comprised of the members of the Education Committee of the Commission of the Californias, chaired by Dr. Ignacio Ortega Becerra, Secretary of Education for the State of Baja California, Norte. Funding was initially provided by a three year grant of $400,000 from the Fund for the Improvement of Postsecondary Education (FIPSE), and supplemented by resources from the Western Behavioral Sciences Institute. The project also received an additional $340,000 in funding from the Digital Equipment Corporation, and was awarded a new FIPSE grant to expand the project to include other groups of non-traditional learners utilizing a distributed conferencing network between member institutions.

The project involved the development of a number of bilingual telecourses, that involved video recorded lectures supplemented by computer conferencing and electronic mail and several courses that were wholly delivered using computer communications. Several universities in the United States and Mexico collaborated in the project, so that Mexican faculty taught video lectures in Spanish under the technical supervision of US faculty, and those courses were offered to Spanish as a first language students in this country.

Purpose

The purpose of this collaborative effort was to experiment with new communications media in distance education, and to attract Hispanic

students into the science and engineering fields. In order to locate qualified Spanish speaking faculty we involved several Mexican institutions and networked several of their faculty and administrators with counterparts from universities in the United States. Thus we called the project BESTNET, which is an acronmym for the Binational English and Spanish Telecommunications Network. It basically represents a consortium of universities, colleges and research institutes in both the United States and Mexico, although the FIPSE grant is housed at San Diego State University and the Digital Equipment Corporation grant at the Western Behavioral Sciences Institute. BESTNET was initially created by the FIPSE grant to produce a number of video telecourses that are now made interactive using computer mediated communication or conferencing. The initial courses are in natural and physical sciences, mathematics and computer sciences, however new courses in other disciplines are now being added by the various member institutions. In addition, both faculty and administrators from each of the member institutions are participating in a number of computer conferences to plan and evaluate the project and to discuss various related interests in the form of symposia and conjoint research projects.

Background and Origins

During the past three years BESTNET has grown into an electronic university consortium with member institutions in each of the Southwestern states and a number of universities, technical institutes and research institutes in Mexico. In BESTNET there are four types of member institutions from which faculty and administrators are currently participating in the conferences on the BESTNET conferencing network:

(1) United States teaching and graduate research institutions, which offer degrees at the doctorate level. These include:

University of California, San Diego
University of California, Irvine
University of Arizona
University of New Mexico

(2) United States teaching and research institutions, which offer graduate degrees at the Master's level and teacher credentials. These include:

San Diego State University
San Bernardino State University
Bakersfield State University
Metropolitan State College, Denver
New Mexico Highlands University

(3) Community Colleges that participate by virtue of a formal two plus two relationship with one or more of the above institutions. These include:

Arizona Western College
Pima College
Denver Community College

(4) Mexican teaching and research institutions, with one or more campuses participating. These include:

Centro de Investigacion Cientifica y Edudios Superiores en Ensenada (CICESE)
Universidad Autonoma de Baja CA, Mexicali, Tijuana and Ensenada campuses.
Insitutito Tecnologico, Mexicali and Tijuana campuses
Universidad Nacionalas Autonoma de Mexico (UNAM)
Centro de Estudios Universidarios Xochicalco
Instituto LatinoAmericano de Estudios Transnacionales
Centro Estudios Tecnico y Superiores

During years 2 and 3 of FIPSE funding representative from these institutions have been engaged in discussions using a VAXnotes conferencing system supplied by the Western Behavioral Sciences Institute for the project. At the present time there are three major conferences involved in both the planning and evaluation of BESTNET

programs. In addition there are several other conferences that are directly related to the offering of BESTNET courses during the final year of the first FIPSE funding and currently under renewed funding.

Project Description

The project involved the use of computer conferencing, including asychronous conferences (where comments are entered and responded at different times) synchronous phone or chat interaction (comments are entered and responded to while everyone is online at the same time for electronic office hours and student support/study groups), and electronic mail, which permit faculty to interact with students at a number of dispersed off-campus sites located in high Hispanic concentration areas. This technology was used in conjunction with video recorded lectures, which formally present course content that is then treated as topics in the computer conferences.

Students watched video lectures either on campus, at home or at off-campus, albeit conveniently located, learning centers in their communities, and then directly interact with faculty by computers donated by the Digital Equipment Corporation networked by telephone modem to a host MicroVAX computer at the Western Behavioral Sciences Institute, which provided a specially tailored version of VAXnotes conferencing software for this project. In this manner students were able to ask questions and receive responses, access class assignments, turn in homework and obtain readings that were downloaded and printed out as hardcopies to take home to study. The Digital Equipment Corporation provided, in conjunction with FIPSE support for this project, 40 VAXmate computer workstations with modems to our learning centers.

Project Results

Since the project began in September, 1985, BESTNET has produced

telecourses in mathematics and computer sciences in cooperation with the Mexican universities listed above. The first course was a two semester video telecourse, entitled "Mathematics Zero," taught by Josefina Castillo of the Centro de Ensenanza Technica y Superior (CETYS), a major private university with campuses in Mexicali, Tijuana and Ensenada. The course is normally taken by CETYS students who do not perform well in the entrance examination for their School of Engineering. It is called "Zero" because it is a non-credit remedial course that covers all high school college preparatory mathematics from algebra through trigonometry. Because the course is the equivalent of a United States university academic skills course, it is of significant value to Hispanic non-traditional learners in the United States, as well as to students attending universities in Latin America. The course was offered for the first time this academic year on a cable public education channel in the Imperial Valley of California, where there is an over 65 percent Hispanic population.

The course attracted seventy-two students, who watched the course on their home televisions and then participated in off-campus study groups throughout the large population dispersed county. This course was offered to introduce bilingual telecourses into the Valley, and interactions between student and faculty were face-to-face and by telephone with a teaching assistant on the Imperial Valley campus. The course is basically a year long review of highschool mathematics with a short introduction to Calculus. According to our pre-enrollment questionnaires we gave the group forty five of the students who enrolled in the course did so to prepare for the California CBEST examination and

remained in the course up till the time when the test was given. The other students did so to prepare for other college mathematics courses (twelve), because of the ESL component of the program (five) and the remainder (ten) for general interest in taking a telecourse from the university.

During the first part of the course prior to the CBEST examination, six students (two CBEST and four from the college preparation group) stopped taking the course. In our follow up we learned they had fallen behind in the programs, and were unable to come into the university to review what they had missed. After the CBEST three of those taking the course for that examination continued, so that there were twenty six students continuing. During the post-CBEST or second half of the course six students dropped out of the program (one CBEST and the remainder of those taking the course for general purposes), leaving seventeen students completing it.

In spite of this attrition rate, there were significantly more students taking and completing the course, than in those enrolled in a general business math course offered in face-to-face meetings during the previous three years. The general business math course has an average enrollment of eight to ten students, with an attrition of normally two or three. We were able to contact 28 of the CBEST students, and learned that 24 had successfully passed the exam, which is significantly better than students who did not take advantage of a preparatory math program.

All the other courses in the BESTNET project are video/computer or only computer conferencing interactive. Video production was completed on Single Variable Calculus, Calculus with Analytic Geometry, Principles of Physics and Introduction to Computer Programming/Pascal and Intermediate Computer Programming/Data

Structures. Each of these courses receive San Diego State University credit in the respective disciplines. Faculty from San Diego State's Mathematical Sciences (which includes Computer Science) and Physics Departments acted as technical consultants in the production of the courses that are taught in Spanish by Mexican university faculty. The Calculus course is a prerequisite requirements in three major fields: computer science, physics and engineering. Likewise, the two courses in computer sciences are required for all majors in that discipline, and the course in physics covers the university general education requirement in physical science.

We also produced an one semester version of the Math Zero or precalculus course -- Mathematics for the Sciences -- that is designed especially for computer interaction. This was taught by Marco Jerez, who teaches the course for Pima College. We developed course under the direction of the Division of Reading, Language and Culture in the School of Education at the University of Arizona.

The course on calculus is taught by Ruben Verela and the courses on physics by Francisco Javier Ortiz Serrano of the Instituto Tecnologico de Mexicali. The course on Introduction to Pascal Programming is taught by Juan Bernal Ienesta and Intermediate Programming by Alejerdo Hinososa Corona, both of the Centro de Investigacion Cientifico y Estudios Superior de Ensenada (CICESE). The Instituto Tecnologico is part of a fifty-three institution system throughout Mexico. CICESE is a public research and graduate institution involved in research on telecommunications, computer sciences, geophysics and oceanography, located in Ensenada, Baja California. Professors Edmund Deaton of the Department of Mathematical

Sciences and Alan Sweedler of the Department of Physics are supervising production faculty from San Diego State University for courses in their respective disciplines.

BESTNET made preparations to offer its programs in precalculus, calculus and introduction to computer sciences video/computer interactive courses at a number of the member universities listed above during summer session. In addition, two of those universities are offered additional computer conferencing based courses on the network. These courses, which are discussed later, are taught respectively by Duane Metzger at the University of California at Irvine and Armando Arias at the University of California at San Diego.

In the video/computer interactive courses students watch the instructional television lectures for four classes, Pre-calculus, Calculus and two in Computer Science, over two semesters on educational access cable learning channels or at conveniently located learning centers in their immediate communities. Student then interact with faculty at the conveniently located learning centers by computer mediated conferencing technology linking each center to a Micro VAX mini computer at Western Behavioral Sciences Institute. Dr. Bellman is working with his colleagues at WBSI to design the information server system front end and tailor the user interface specifically for distance education as defined by the requirements of the BESTNET project. Dr. Bellman is in charge of the MicroVAX research project at WBSI that is funded by DEC to examine distance education applications of VAXnotes and ways to integrate it into a complete system. This involves combining a variety of software components -- VAXnotes, PHONE, EMAIL, videotex, VAX Pascal and specially developed VMS programs. The system permits students to easily access

readings and other texts, assignments and examinations, and then programs and upload all completed assignments, questions, and other materials. The faculty and teaching assistants then access those materials and upload their responses to the students. The MAIL and PHONE utilities are designed to provide for online electronic office hours and personal consultations between students, teaching assistants and faculty.

Each center is under the direction of a faculty member from one of the respective institutions in the project. The initial universities participating in the summer implementation program are San Diego State University, Arizona Western College with a site at San Luis on the border, University of California at Irvine, University of Arizona in collaboration with Pima College, Metropolitan State College in Denver and the University of New Mexico.

In addition to the faculty from each institution, learning center coordinators manage each site and act as teaching assistants to the faculty teaching the course. They are in contact with the faculty, as well as other technical consultants to assist in the computer mediate teleconferencing, in two separate metaconferences. The first is a teaching assistant conference, whereby the faculty provide special instructions to the coordinators in how to handle the weeks assignments, discuss course content topics and various pedagogical issues as they arise. The second metaconference, a "help and technical talk" conference is used to assist coordinators in resolving any technical problems involved in the implementation of the telecourses.

Faculty, administrators and learning center coordinators from each

of the participating institutions recently attended a three day workshop/seminar. We began by teaching learning computer conferencing techniques, how to up and down load assignments, run and compile programs to be used in the courses and the like. The participants also previewed the course materials and discussed them with the faculty teaching in the program. In addition, we provided instruction in how to set up the types of computer workstations provided by the Digital Equipment Corporation for the project, and discussed our next stage plans of installing Vaxnotes on each campus and connecting the nodes using DECnet to create a distributed conferencing system.

We offered Math 107, Introduction to Computer Sciences at the Imperial Valley campus as a pre-test of the computer interactive component of the courses. We consider the course to be a pilot implementation, and consequently have restricted enrollment to only a limited amount of students. When we first announced the course there were a number of inquiries, but we restricted enrollment to fifteen students from that campus, and another seven students and faculty from the Instituto Tecnologico in Mexicali. We invited the Mexican university participation in order to provide a demonstration to the faculty for them to see how the Calculus courses is implemented by them.

In spite of our restriction on size, the class size from San Diego State University was virtually the same as the math courses offered in face to face classrooms. In addition, we developed a waiting list for entry into the course for when it is to be offered again. We gave the students a pre-course questionnaire to access each student's experience with computers prior to taking the course. Only two of the seven San Diego State University students had any previous experience with computers, which was a word processing course taken in the community

college. The other SDSU students had no previous computer training, but had taken as a preparation for Introduction to Programming the pre-calculus Math Zero course described above.

The students from the Instituto Tecnologico were much more sophisticated, as all had taken BASIC programming and were enrolled in one of the engineering majors offered by the institution. Only the San Diego State University students took the course for United States credit, and the IT-M students received their respective institutional credit. However, four of Mexicali students were faculty at the IT-M who participated in the class as participant observers. There has been a general satisfaction among the San Diego State University, Calexico students with the course. However, one student dropped the course after less than one month due to family pressures. The remainder of those students are doing an average of B minus (with a range of C, C, C+, B-, B) work in the course at midterm, which is approximately the same as students taking the class on the main campus in San Diego. It is important to note, however, that these students lack the general mathematical background of those students who taking the course in regular classrooms in the Department of Mathematical Sciences at the San Diego campus. We have also compared relative progress in both quality of assignments and grades in comparable examinations between the groups of students, and found that the BESTNET students did as well as the mean of those taking the course in San Diego. In our mid-term questionnaire the IT-M students as a whole did better than both groups, but felt that the video lectures are a little slow-paced. However, as mentioned above all these students had a previous computer programming course, and they were also engineering majors. Their participation in this pilot

implementation was done as a quality control on the lectures.

The course is fully computer interactive, using the VAXnotes conferencing system mentioned above. Students watch the video lectures, and then interact with the faculty or graduate teaching assistant from the San Diego State University Mathematical Sciences Department online. In this manner they access all course assignments, turn in homework, take examinations, ask questions about the lectures and the like. In addition, the faculty and graduate teaching assistant have online "electronic office hours" at specified times during the week. After the students logon to VAXnotes they are asked if they want to connect with a teacher assistant if one is available. A positive response places them into the synchronous PHONE utility on the system. If the student wants to discuss a particular file that he or she uploaded into the system, it can be recalled as a window in PHONE and can be scrolled to various parts of the text. Students are also able to ask private questions using VAX EMAIL, and receive personal tutoring in this manner. The combined system -- conferences, PHONE and EMAIL, forces all students to be active participants in their educational process instead of passive as is the case in most other types of telecourse situations.

As a result of the initial success of our pre-test we are offering the Introduction to Computer Science and Pre-Calculus course to students at Pima College (in conjunction with the University of Arizona), University of New Mexico, Metropolitan State College at Denver and the University of California at Irvine. The latter university offered BESTNET as part of a special high-school summer bridge program for Latino students.

Summary and Conclusions

Thus, we developed and are offering six courses that were produced

under the auspices of the FIPSE grant, and also a number of others that are being developed and/or are being given by faculty at various of the institutions. Each of the universities is offering their own credit for the courses. The six FIPSE courses meet prerequisite requirements for several different majors as described in the San Diego State University catalog, and also meet identical requirements for those same majors at each of the above named institutions. As previously mentioned, the courses were produced under the technical supervision of the faculty of the departments of mathematical sciences and physics at San Diego State University. Consequently, all California resident students are given San Diego State University credit for them and University of California credit is now being negotiated. Although the latter is desirable in the long term, at the present time California students receiving CSU credit can easily articulate the course and receive UC credit. Students outside of California are given credit from each of the other institutions in their respective areas.

In addition to the six courses already developed, some of the other member institutions in this project will also be offering video telecourses that that they independently developed. Under the auspices of this project we are creating a computer conferencing component to those courses, making them available to each of the other participating institutions. In this manner we will be able to quickly expand the offerings in each of the major fields, and to provide a methodology for the articulation of these courses throughout the consortium.

At the present time a total of eighty faculty and administrators from each of our member institutions are participating in a series of computer teleconferences to discuss various aspects of our project.

This includes the development of an outreach plan relative to the particular regional interests for each site. Because of this early interest and planning for the project, faculty and administrators are now discussing in the BESTNET conferences ways to advertise our courses along with their general student recruitment and program efforts, as part of their regular publicity campaigns.

Because several of our learning centers are established at off-campus satellite teaching sites connected with our member institutions, information about our project is currently being disseminated in them. Many of our coordination faculty have been discussing the project with selected students, and are encouraging both their participation in it, and the communication about the program to their peers. These efforts will significantly increase during the fall semester of the coming academic year.

In addition, we are making public service announcements in the local media for each institution and, in concert with the coordination faculty on each campus, provide press releases and other information early during the fall semester. Where appropriate we also have learning channels announce our courses as part of their video text information presented during non-programming hours. We also provide press releases and have learning center coordinators visit a number of local highschools to recruit students in their senior year of study, also those already targeted to be involved in bridge programs.

In addition to Introduction to Programming we also offered two other courses that are solely delivered by computer conferencing, entitled "The Anthropology of the Border" and "Networking with Intercultural Communications." The first course is being offered by Duane Metzger of

the University of California at Irvine. The course also has students participating for credit at the University of California at San Diego in the Department of Communications and the University of Arizona. In addition, there are observers in the course from the UC-MEXUS at the University of California at Riverside, the Institute for Regional Studies of the Californias at San Diego State University, the Calexico campus at San Diego State University and faculty from CICESE, the Universidad Autonoma de Baja California in Tijuana and the Instituto Tecnologico in Mexicali. The Networking course is being taught by Armando Arias at the University of California in San Diego. It is being given to a number of advanced communication students who are interested in the BESTNET project. As part of the course they are participating in BESTNET conferences, and discussing various issues involved with intercultural communication issues in the medium. Both courses began at the beginning of April, and involve a seminar type discussion format.

We are experimented with conference structure in these courses to determine the most effective ways to utilize the VAXnotes branching structure. Because those in the UCSD networking course are more sophisticated with conferencing, we are making full use of the topic-reply structure on the system. In comparison, we are using a more linear structure, similiar to EIES's serial order of comments,in the UC-I seminar on the border. Thus we use branching only for specific responses to particular topics without encouraging a string of replies. As a result the UCSD conference has many more topics simultaneously being discussed. In this manner we are examining if branching should be fully utilized to create off-shoot conferences, or whether replies should be more formally used either as a method for turning in assignments and for specific and short responses to a topic. Both

courses also involve the use of synchronous PHONE and EMAIL.

The course conferences were quite active. There is no way to compare student progress in the courses as they were developed expressly to test out VAXnotes for online seminar BESTNET related courses. However, the UCSD conference discussed several different topics in a number of reply strings off of topics. This has had the effect of slowing the linear development of topics. The UCI conference, on the other hand, has many more topics entered, but following a general theme. Our tentative expectation is that the UCI method is more useful for more structured types of discussions, whereas the UCSD method is viable for courses where there are a number of themes and do not follow a tight syllabus format.

We conducted a survey of student satisfaction and success with the courses and noted a great deal of enthusiasm from all those involved. Also, we conducted a content analysis of their comments in the conferences, which showed that the students took the conferences very seriously by taking time to study their responses before writing in their contributions. Thus, the quality of student comments in both courses is very high and shows a real concern with the topics covered in them. It is important to note that both courses are the result of discussion in the BESTNET planning and evaluation conferences comprised by administrators and faculty from each of the participating institutions. We are planning to offer these type of courses on a regular basis, along with the video/computer interactive science and mathematics courses discussed above.

We have been fortunate in generating considerable interest in BESTNET. This includes being cited by the California Postsecondary

Education Commission to the California State Legislature as one of the most innovative postsecondary education projects in the past year. The project was written up in the UCMEXUS News, San Diego Report, Contract and Grants Magazine, Learning and Technology Newsletter, the December issue of the Hispanic Times and the April issue of Frontier Business. Hence, we consider the project to be doing very well during this 3rd year of its existence. During our funding it has grown from a project at San Diego State University and Western Behavioral Sciences Institute to a major educational experiment of a number of universities in the southwest and in Mexico.